Claims

1. A rolling bearing characterized in that:

a plurality of rolling elements are incorporated between one pair of bearing rings;

each of said bearing rings has a raceway groove composed of a raceway surface having a larger radius than a radius of said rolling elements, at least one bearing ring being composed of two raceway surfaces;

said rolling elements have an outside diameter of a rolling contact face with a curvature in the axial direction, and are arranged crosswise so that the central axes of rotation of the rolling elements are skewed alternately in the circumferential direction of said bearing rings, an outer peripheral face of each of said rolling elements is always in contact with a raceway surface of one bearing ring and a raceway surface of the other bearing ring, which are opposed to each other, at each one point, or two points in total;

each of one pair of bearing rings is monolithically formed; and

a groove of desired depth is provided in a part of the raceway groove for either one or both of said bearing rings.

2. The rolling bearing according to claim 1, characterized in that said rolling bearing further comprises a retainer for retaining said plurality of rolling elements between said pair of bearing rings, and said retainer has only

one axial pocket face in a pocket for retaining said rolling element, with a face opposed to said axial pocket face being opened, in which said axial pocket faces are arranged inclinedly on the opposite side to each other in the axial direction, corresponding to a direction of inclination of said rolling elements incorporated crosswise to each other in the circumferential direction of said bearing rings.

3. The rolling bearing according to claim 1, characterized in that said rolling bearing further comprises a retainer for retaining said plurality of rolling elements between said pair of bearing rings, and said retainer has only one axial pocket face in a pocket for retaining said rolling element, in which said axial pocket faces are arranged inclinedly on the opposite side to each other in the axial direction, corresponding to a direction of inclination of said rolling elements incorporated crosswise to each other in the circumferential direction of said bearing rings.

4. The rolling bearing according to claim 1 or 2, characterized in that each of said rolling elements has at least one planar portion, in which said planar portion is in contact with the axial pocket face of said retainer.

5. A direct drive motor having a structure in which a stator is disposed in at least one or both of the inside and the outside of a rotor, and a bearing is provided to support the rotation and load, in which said motor is capable of driving

the load by being directly connected to the load without using a speed reducer, characterized in that said bearing is the rolling bearing according to any one of claims 1 to 4.

6. A direct drive motor having a structure in which a stator is disposed in either one or both of an inside and an outside of a rotor, and a bearing is provided to support a rotation and load, in which said motor is capable of driving the load by being directly connected to the load without using a speed reducer, characterized in that said bearing has a plurality of rolling elements incorporated between a pair of bearing rings, each of said bearing rings having a raceway groove composed of a raceway surface having a larger radius than the radius of said rolling elements, at least one of said bearing rings being composed of two raceway surfaces, in which each of said rolling elements has an outside diameter of a rolling contact face with a curvature in the axial direction, said rolling elements are disposed crosswise so that the central axes of rotation of the rolling elements are skewed alternately with each other in the circumferential direction of said bearing rings, and an outer peripheral face of each rolling element is always in point contact with the raceway surface of one of the bearing rings and the raceway surface of the other of the bearing rings, which are opposed to each other, at each one point, or at two points in total.

7. The direct drive motor according to claim 6,

characterized in that each of said rolling element is an upper and lower sides cut ball having one set of opposing faces, in which the central axis of rotation of the rolling element is orthogonal to each opposing face.

8. The direct drive motor according to claim 6, characterized in that each of said rolling elements is a one-side cut ball having a cut face, in which the central axis of rotation of the rolling element is orthogonal to the cut face.